APPENDIX G
OPERATIONS MANUAL
FOR
LOCAL DROUGHT MANAGEMENT

I. INTRODUCTION

Following the drought year of 1988, Montanans began to reconsider how to respond to drought and its impacts. The issue of drought management was identified for further study by the Montana Legislative Water Policy Committee. The state water plan process was selected as the best approach to developing a strategy for state and local response. From the beginning of the process, it was clear the state needed to develop a strategy for dealing with drought before drought situations became acute.

A steering committee comprising representatives of water user groups and water management agencies identified issues, considered options, and made recommendations to address the effects of drought in advance of its onset. An effective response system would require coordination of local, state, and federal agencies to administer programs for drought monitoring, impact assessment, assistance, education, and mitigation. The committee recommended that the state drought advisory committee, upon the request of a county, should assist communities in organizing local drought advisory committees and provide necessary support and assistance. That recommendation stated, in part:

> *"Committee membership should be comprised of state and local government officials, including county disaster services coordinators and conservation district supervisors; local water user groups, including dryland and irrigated agriculture, municipal and rural water suppliers, energy producers, mining and mineral processing, forest products, tourism, recreationists and recreation-based businesses, and interested citizens."*

In 1991, the Montana Legislature passed House Bill 537, which established the Montana Drought Advisory Committee (DAC) and defined its membership and responsibilities. Two related duties listed by the statute are:

> (3)(d) identify areas of the state with a high probability of drought and target reporting and assistance efforts to those areas; and
>
> (e) upon request, assist in organizing local drought advisory committees for the areas identified under subsection (3)(d). 2-15-3308 MCA (1991).

The statute called for a "report to the governor describing the potential for drought" to be released by March 15th of each year. The DAC would use the report to identify the regions of the state where drought conditions appeared. In 1992, DAC Chairperson Lt. Governor Dennis Rehberg issued a press release, on behalf of the DAC and Governor Stephens, encouraging local officials in these areas to form local drought advisory committees (LDACs):

> *"Local planning involving local people is the only way to develop a successful response to any drought related water shortages which may occur in Montana this year. We can't and we won't dictate solutions from Helena. What we will do is help local planners with information and any resources we have available to make their local plans moreeffective."*

In 1992, over 30 counties convened LDACs to identify areas of potential water supply problems and develop voluntary actions that water users could employ to prevent these problems before they could occur.

In 1993, a survey was developed to evaluate the effectiveness of LDACs for all 56 counties in the state. The survey results indicated that in counties that were affected by drought where an LDAC had been formed, over 95 percent of those surveyed thought that the meetings were informative, that they would participate on LDACs in the future, and that the LDAC provided benefits to the people of their community.

During drought the DAC provides a variety of information to LDACs. This local drought planning operations manual includes information that is tailored to the types of problems and impacts most commonly encountered during drought.

II. MUNICIPAL, PRIVATE, AND PUBLIC WATER SYSTEMS

A. Municipal Water Supplies

The Montana Department of Environmental Quality (DEQ) is responsible for monitoring the availability of municipal water supplies for communities. Operators of municipal water delivery systems are licensed by DEQ and are required to attend workshops and training seminars periodically to maintain and improve managerial expertise. Operators sample municipal water supplies on a regular basis and submit the samples to DEQ to test water purity and compliance with state and federal drinking water standards.

In communities using surface water for municipal supplies, drought conditions can cause impurities to violate drinking water standards. In communities that depend on groundwater for municipal water supplies, drought can cause the rate of use to exceed the rate of recharge, resulting in a net annual decline in aquifer levels. This situation can change groundwater quality necessitating measures such as water treatment to meet standards. Monitoring activities are increased during drought periods with particular attention to communities with a history of water quality problems.

Drought may make it difficult for municipalities and individuals to obtain enough potable water, possibly resulting in significant impacts on public health. Increasing withdrawals from surface sources to satisfy demands for domestic, irrigation and industrial water users may damage aquatic life. Discharge of sewage and other wastes at low stream flows can damage aquatic resources and threaten public health. For these reasons, DEQ plays a role in water management during droughts in Montana. The following information summarizes these responsibilities.

B. Private Water Supplies

1. Drought impacts

Well-constructed private water supplies are unlikely to be affected by drought conditions. Unfortunately, many private supplies are not properly constructed. They rely on surface supplies such as *pipe in the lake* systems. Some private systems rely on springs, or shallow aquifers that may be affected by drought.

2. Affected supplies

DEQ has no way, other than voluntary reporting, of determining which private water supplies may be affected by drought.

3. Department responses

Owners of private water supplies will usually be responsible for securing alternate sources of water during drought conditions. Information about the sanitary protection of potable water will be provided to individuals upon request and to the public through news releases.

C. Public Water Supplies

1. Drought impacts

The impact of a drought on public water supplies depends, to some degree, on the source of supply. Supplies fed by small surface sources or groundwater derived from such sources are most vulnerable to drought. DEQ, The Army Corps of Engineers, and DNRC all have special emergency programs to supply communities with potable drinking water.

2. Supplies likely to be affected

DEQ can determine which supplies in an area are most susceptible to impairment. Information stored in various files and on the state computer system allow DEQ to determine the source(s) of water for each of approximately 720 community systems in Montana. The systems are classified into one of these categories; surface water systems, groundwater systems and those which use both surface and groundwater.

3. Capability of water systems to withstand drought

a. Surface Water Systems

Information concerning surface water flows and reservoir water levels is obtained from the United States Geological Survey (USGS), the Montana Department of Natural Resources and Conservation (DNRC), the Montana Department of Fish, Wildlife and Parks (DFWP), public water supply systems, and DEQ records. This information is used to determine which systems will be most affected by drought.

b. Groundwater Systems

Communities with groundwater systems are encouraged to monitor levels to determine if they are declining. DEQ also obtains information on groundwater levels from the USGS, the Montana Bureau of Mines and Geology, and groundwater users.

The most vulnerable groundwater systems are monitored by DEQ to determine their ability to withstand drought conditions. Assessments include information about alternate water sources for the system, the possibility of implementing water use restrictions, and potential health impacts of water shortages.

4. DEQ response

a. Cooperation

DEQ will work with public water supplies, local health departments and other agencies to minimize the impact of drought on public health. DEQ will ensure the provision of potable water to the citizens of impacted areas.

b. Services provided by DEQ:

1. Information on water conservation techniques to make the best use of a limited resource
2. Advice on the use of alternate sources and options for obtaining additional water
3. Treatment alternatives to ensure safe water
4. Assistance in preparing press releases and notices
5. Cooperative efforts with funding agencies to find funds for emergency and/or long term solutions
6. When necessary, DEQ and Disaster and Emergency Services, may rely on the state's emergency water disinfection and filtration units to provide a temporary source of potable water.

b. Legal responsibility

If there is an imminent threat to public health, the DEQ may require a public water supply to take special measures to protect the health of its citizens (ARM 16.20.277). Those measures would most often be the implementation of strict water use restrictions to maintain pressure in the distribution system and the provision of adequate water for domestic uses. Where contamination is a risk, boil orders or health advisories may be issued.

D. Department Contacts

Listed below are phone numbers of DEQ sections with drought responsibilities:

Response Area	Phone No.
Public Water Supply	444-4549
Surface Water Quality	444-2406
Groundwater Quality	444-2406
Waste Discharges	444-2406

III. FIRE SUPPRESSION

A. Conservation Reserve Program (CRP) Lands

Conservation Reserve Program lands represent a large source of potential wildfire fuels during periods of drought. USDA will only release CRP lands for grazing under extreme circumstances. When CRP land is released the program participant must reimburse the government for the value of the feed. Most producers elect to leave the land in the program rather than pay the value of the forage. Besides the responsibility to maintain the idle land for weed control, producers can construct fire breaks to stem the advance of a potential wildfire. It would be worthwhile for a community to inventory CRP lands assess the implications and risks of a large range fire and who would potentially be affected.

The Montana Department of Natural Resources and Conservation (DNRC) urges communities to develop and coordinate a fire response plan with federal, state, and local officials for wildfires that cross jurisdictional boundaries. This process may require a memorandum of understanding that addresses firefighting resources and responsibilities.

DNRC is responsible for the prevention and suppression of wildland fires on state-owned lands. Specifically, the Montana Drought Response Plan requires DNRC to identify those areas of extreme fire danger due to drought conditions and provide daily assessments of the capabilities, resources, and sources of assistance available both within and outside the agency.

B. Wildland Fire Danger

All state and federal wildland firefighting organizations use the National Fire Danger Rating System to assess and monitor the conditions contributing to extreme fire danger. The fire danger rating system is composed of several indices which describe the probability of a fire start, the expected intensity of the fire, and the difficulty to be expected in control of the fire.
These indices are derived and updated daily from current weather and fuel moisture information gathered at over 90 reporting stations in Montana. The reporting stations enter their local information into a fire computer system that provides DNRC with current fire danger information in almost any location in the state. This information, coupled with two daily fire weather forecasts from the National Weather Service, provides DNRC with the information necessary to plan and react to wildfire occurrences.

Besides monitoring the conditions which contribute to fire occurrences, DNRC also monitors the availability and use of personnel and equipment within DNRCand other wildland firefighting organizations. A daily situation report on the use and availability of all firefighting equipment and personnel is summarized by DNRC and provided to all wildland firefighting organizations.

Most of DNRC's fire suppression planning efforts are centered in Missoula at the Fire Coordination Center. DNRC's field offices provide specific fire information on a regional basis. A list of DNRC offices and phone numbers is attached.

C. Drought Impacts On State-Owned Lands

DNRC leases most of the 5 million acres of state-owned land it manages for grazing and agriculture. Extended periods of drought reduce the income- producing potential of these lands for the school trust fund and contribute to a long term decline in productivity.

IV. FIRE RESPONSE SYSTEM

DNRC is responsible for minimizing the impact of wildfires through the wildland fire prevention, pre-suppression, and suppression programs and activities it conducts. DNRC is charged by statute with sound management of the school trust land resources. This is accomplished through field activities intended to reducing drought related impacts on state-owned lands wherever possible.

A. Prevention

Before the start of the fire season, DNRC and other wildland fire fighting organizations, initiate a plan to reduce wildfires. If drought conditions persist, the plan is updated and active fire prevention activities initiated. Some of these include:

1. Use of press releases to notify the public of fire danger.

2. Delineation of high hazard areas and patrolling, posting, and restricting access into these areas.

3. Cancellation of open burning permits and requesting the public to voluntarily cease operations involving the use of fire.

4. Increasing cooperation and coordination with other fire protection agencies and county governments.

B. Pre-Suppression

As drought and fire conditions worsen, DNRC will initiate an increasingly active fire detection and response system aimed at rapid detection and deployment of firefighting assets. Increasing the frequency and duration of aerial detection flights and pre-positioning personnel and equipment to high hazard areas helps reduce the response time to attack fires. The preparedness and readiness of DNRC personnel and equipment is stepped up as conditions worsen.

C. Suppression

Suppression activities include the initial attack, containment, control, and extinguishing of a fire. DNRC uses all the resources at its disposal to suppress the impact of wildfire.

V. RESTRICTIONS ON ACTIVITIES

A. DNRC Policy

DNRC may, designate areas of high fire hazard and request all persons, firms, or corporations present or engaged in any activity in the areas to voluntarily cease operations or to adjust working hours to less critical periods of the day. In the event such a request is refused, DNRC can order compliance.

B. Closure Of Areas Due To Fire Danger

When 1) drought conditions exceed the normal seasonal buildup, endanger life and property, and are predicted to continue; 2) it is questionable if local forces will be able to cope with additional fires, and 3) the county has initiated active fire prevention, detection, pre-suppression and suppression programs, a fire closure may be instituted to reduce or prevent human and other resources losses.

Under 87-3-106 MCA the Governor, upon recommendation DNRC, may close an area or county to trespass because of fire danger, and that area is automatically closed to hunting, fishing, etc., and remains closed as long as the fire closure remains in effect. Closures are very hard to administer and, therefore, careful consideration must be given to all aspects of a closure prior to requesting one. A careful analysis of fire conditions and weather trends, followed by close coordination between all agencies and strong local actions to enforce the closure, are necessities.

Requests for a fire closure must come from the governing body of the county. Requests received from other sources will be referred back to the County Commissioners for their recommendation. This request should be submitted to DNRC for its consideration prior to being forwarded to the Governor.

VI. DROUGHT RELATED IMPACTS ON STATE OWNED LANDS

A. DNRC Policy

DNRC assists lessees of state-owned land to solve drought related problems on state lands. Technical assistance and cost share assistance is available for improvements on state-owned lands. Resource development cost share assistance on new stockwater developments, range renovation projects and irrigation systems is normally available to state lessees on approved projects.

B. Contacts For Drought Response Information

Contact	Phone #
1) Dept of Natural Resources	444-2074
2) DNRC Fire Coordination Center	542-4290

Other contacts for regional information are as follows:

Office	Location	Phone
Northwestern Land Office	Kalispell	542-7994
Southwestern Land Office	Missoula	542-4200
Central Land Office	Helena	444-3633
Northeastern Land Office	Lewistown	538-5989
Southern Land Office	Billings	259-3264
Eastern Land Office	Miles City	232-2034

U.S. Forest Service Fire Information:

National Forest	Phone #
Bitterroot	363-3131
Clearwater	(208) 476-4541
Custer	657-6600
Deer Lodge	683-3975
Flathead	755-5401
Gallatin	587-6719
Helena	449-5201, 449-5475
Kootenai	293-6511
Lewis and Clark	791-7707, 791-7751
Lolo	329-3857

VII. AGRICULTURE

Drought affects all aspects of Montana agriculture: dryland and irrigated farming, livestock, and the many local service economies that depend on its stability and support. Assistance is available in many forms from a variety of state and federal agencies. Inquiries about assistance should be directed to local county USDA and state agency offices. The Montana Department of Agriculture works closely with USDA in coordinating data collection, and providing financial and technical assistance to those producers affected by drought. Most short-term financial assistance for drought impacts is available through the USDA. Long-term assistance is available from DNRC, through water development grants and loans, and the NRCS (USDA) for technical assistance in designing farm water projects.

The Montana Drought Response Plan contains useful information for those seeking all forms of assistance (See Federal and State Agencies section and state agency annexes in the Appendix). Irrigation comprises about 97 percent of all fresh water use in Montana. In drought years, surface water supplies are usually inadequate to meet the demands of all irrigators. The prior appropriation doctrine governs the use of surface water in Montana. The Missouri River basin is currently in the process of adjudication to determine the ownership of water rights. The Yellowstone River basin has been adjudicated, so questions of allocation are more easily resolved for that river basin. The Department of Agriculture recommends the following objectives:

1) Additional water storage facilities for water supplies should be developed and available to reduce drought impacts.

2) Existing water storage facilities should be enhanced to meet irrigation needs and augment instream flows.

3) Cooperation between water users should be developed to augment instream flows including regulated releases from storage facilities.

The following program phone numbers are commonly requested:

1) Livestock Operations - Call Hay/Pasture Hotline @ (406) 444-2402 or local county CFSA office for stockwater well assistance

2) Federal Assistance Programs - Contact local CFSA office

3) Internal Revenue Service Tax Considerations - Farmers Tax Guide, Publication # 225 from IRS Helena @ (406) 449-5250 or 1-800-829-1040

4) Permits Required for Water Use Activities - Contact local Natural Resource Conservation Service (NRCS) office or regional DNRC office.

5) Local Water Conservation - Contact county NRCS office or DNRC regional office (DNRC Helena 444-6601), Montana Watercourse (406) 994-6671.

9) Dryland Agriculture - Local CFSA office or MT Dept. Ag. 444-2402.

* see also Department of Agriculture and Livestock annexes to state drought response plan and list of agricultural publications at end of this guide.

Agriculture Phone Numbers

Department of Agriculture -	(406) 444-3144
Agriculture Electronic Bulletin Board-	1-800-962-1729
Department of Livestock -	(406) 444-2043
Montana Livestock Crimestoppers -	1-800-647-7464
Hay/Pasture Hot-line -	(406) 444-2402

VIII. WATER SUPPLY INFORMATION

Water supply and soil moisture data are available from several sources:

1) Water supply and soil moisture maps (Surface Water Supply Index and Palmer Drought Severity Index), climate data, streamflow, drought impact assessments - Montana State Library, Natural Resource Information System (NRIS) through State Electronic Bulletin Board: 1-800-962-1729 or if calling from Helena: 444-5648. or Internet World-Wide Web: http:/nris.msl.mt.gov

2) Soil moisture - MT Agricultural Statistics Service, Helena (406) 449-5303 or 1-800-835-2612; DNRC @ 444-6637; or a local NRCS office.

3) Streamflow - Current, and historic and monthly averages - U.S. Geological Survey, Helena (406) 449-5263. Internet address: http://wwwdmthln.cr.usgs.gov/ for current and historical streamflow data, by county or river basin.

4) Reservoirs - U.S. Bureau of Reclamation, Billings 1-800-775-0868; Montana Power Company 1-800-424-5555; U.S. Army Corps (406) 444-6670.

5) State-owned reservoirs - DNRC, (Helena) (406) 444-6646.

6) State Drought Advisory Committee - DNRC (Helena) (406) 444-6637

Water Conservation Information:

1) A Catalog of Water Conservation Resources (1993) - The Montana Watercourse, Montana State University (406) 994-6671.

2) County Extension Service - See local directory

IX. FISHERIES AND TOURISM

Drought can cause serious impacts to the state's fisheries during periods of reduced streamflow. During low streamflow water temperatures rise, reducing available dissolved oxygen needed by fish, and concentrating suspended sediments and toxic substances. Low streamflow also reduces cover for young fish increasing predation by larger fish. Many Montana communities derive significant local revenues from the fishing-related dusiness and the secondary commerce it generates.

LDACs can provide a forum for local tourism-related business and agricultural water users to discuss streamflow issues. The local DFWP biologist can be helpful in identifying minimum streamflow levels necessary to sustain the local fisheries. These low figures can be used as target objectives in a cooperative local effort to mitigate fish kills in the short-term. Arrangements have been made in the past to scale back irrigation withdrawals for as little as a week during which time streamflow can recover, reaching acceptable levels and averting fish kills.

If a river basin planning committee is operational in the basin, LDACs can coordinate instream flow mitigation with the basin committee. LDACs can request assistance from the Drought Advisory Committee by contacting DNRC's Water Resources Division @ (406) 444-6637 or a DNRC regional office.

Drought conditions also can affect local economies by reducing tourism. State and federal lands may have uses restricted during fire season. LDACs can keep the Montana Department of Commerce informed of restricted travel due to fire or the presence and of special fishing regulations for drought so that Commerce can inform callers on its out-of-state toll-free tourism hotline.

Phone Numbers For Fishery Or Tourism Issues

Fisheries - Contact MT DFWP regional office or Fisheries Division @ (406) 444-2449 (Helena).
Tourism and recreation - Montana Department of Commerce @ (406) 444-2654

X. LOCAL MEDIA

A. Local Drought Committee Meetings

It is important for communities to be notified of scheduled local drought committee meetings to ensure that all concerned citizens will have an opportunity to be heard and to hear the information provided by state, local, and federal agencies and other participants. It is advisable to place a notice in the local press and a spot on local radio at least three days before to the meeting.

Local public service announcements can complement the Governor's messages with a message tailored to address issues of local concern. The Such announcements can offer an opportunity for local officials to bring attention to local water conservation ordinances in effect, upcoming local drought meetings, and a variety of other information.

B. Sample Drought PSA

The public service announcement below has been used successfully in Montana to promote water conservation and drought awareness. It is one minute long and can, in many cases be recorded over the phone by local radio stations. Local stations are usually willing to broadcast announcements free of charge as a service to their communities.

> Please do your part to conserve water to help Montana get through this summer without unnecessary hardship due to low water supplies. This is (*announcer's name and position*) of the Montana *county* drought advisory committee or *county commissioner* with some tips on how to save water. Use as little water as possible to get the job done. Check irrigation systems for leaks and efficiency. Try to apply water sparingly, avoiding sprinkling on hot, windy days. Don't run showers and faucets for long periods of time. Use plastic bottles or bricks in toilet tanks to reduce the amount of water to flush.
>
> Water your lawn only when necessary, and in the morning or evening , when the sun and wind won't evaporate the water before it hits the grass. Make sure that you're not watering the sidewalk or street when you turn on your sprinkler. Remember, a deep soaking encourages a deeper root system, which doesn't need frequent watering. Use a broom and not the hose to clean sidewalks and streets. Check for leaks in pipes, hoses, faucets, and couplings. Only run the dish and clothes washers when you have a full load. Following these tips will help you do your part to get Montana through this dry period. For more information, call _____ @ _____.

Information about local sources of drought-related information can be added to the end of the PSA.

XI. MEDIATION, FACILITATION, DISPUTE RESOLUTION SERVICES

The Montana Consensus Council is a service offered by the Governors office focusing on short and long-term solutions to natural resource issues. Phone 444-2075 for more information.

Agriculture Publications

Cattle Management During Drought, Roger Brownson
Beef Cattle Specialist, Montana State University Extension

Emergency Rations for Wintering Beef Cows, Roger Brownson
Beef Cattle Specialist, Montana State University Extension

Hay Buying Tips, Rodney Kott and Roger Brownson
Sheep Specialist and Cattle Specialist, respectively
Montana State University Extension

Dealing with Drought on Range, John Lacey
Range Management Specialist, Montana State University Extension

Substituting Grain for Hay in Wintering-Ewe Rations, Rodney Kott
Sheep Specialist, Montana State University Extension

Buying and Selling Livestock Due to Drought, Roger Brownson
Beef Cattle Specialist, Montana State University Extension

Tax Implications of Drought Sales of Livestock, Alan E. Baquet
Farm Management Specialist, Montana State University Extension

Feeding Value of Light Weight Barley, Rodney Kott and Roger Brownson
Sheep Specialist and Cattle Specialist, respectively
Montana State University Extension

Sheep Management During Drought, Rodney Kott,
Sheep Specialist, Montana State University Extension

Nitrates in Livestock Feeding: A Problem in Drought Conditions, Rodney Kott,
Sheep Specialist, Montana State University Extension

Cattle Feed Management in Drought, Roger Brownson
Beef Cattle Specialist, Montana State University Extension

Ammoniated Straw for Beef Cattle, Roger Brownson
Beef Cattle Specialist, Montana State University Extension

Reducing Drought Effects On Croplands In The West-Central Great Plains
USDA, Agriculture Information Bulletin Number 420, 6/79
Prepared by Science and Education Administration
Copies available from Montana DNRC 444-6637.